**Chapter 5 heat transfer**

**-p73 hold hands in water**

**-p74 table lamp**

**-boil piece of food activity p74**

**Transfer of energy**

**Heat-**

**Q=ΔU + W**

**Heat added to a system=change in thermal energy of the system + work done by the system**

**System-**

**Hand example**

**-as the fast moving molecules hit your hand, they transferred energy to your hand through conduction**

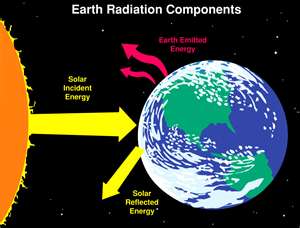
**Conduction-**

[](http://images.search.yahoo.com/images/view;_ylt=A0PDoX6w4TlPqEYAxPiJzbkF;_ylu=X3oDMTBlMTQ4cGxyBHNlYwNzcgRzbGsDaW1n?back=http%3A%2F%2Fimages.search.yahoo.com%2Fsearch%2Fimages%3Fp%3Dconduction%26n%3D30%26ei%3Dutf-8%26tab%3Dorganic%26ri%3D4&w=720&h=417&imgurl=www.jonschrage.com%2F2xats113%2F2xE1L3%2Fconduction.jpg&rurl=http%3A%2F%2Fwww.jonschrage.com%2F2xats113%2F2xE1L3%2Ffriendly.html&size=108.6+KB&name=Conduction&p=conduction&oid=46cf505ad2cb60f46ea0125331183fa9&fr2=&fr=&tt=Conduction&b=0&ni=36&no=4&tab=organic&ts=&sigr=11nkh4gco&sigb=12on67oq6&sigi=11h2qs86k&.crumb=oRJdnVE3N2L)

**Letting sun warm you up**

**-sun transferred it to you through radiation**

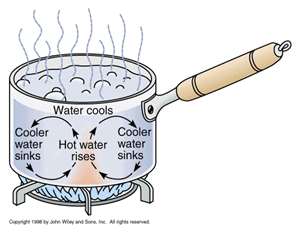
**Radiation**

[](http://images.search.yahoo.com/images/view;_ylt=A0PDoX4v4TlPsE0AsAyJzbkF;_ylu=X3oDMTBlMTQ4cGxyBHNlYwNzcgRzbGsDaW1n?back=http%3A%2F%2Fimages.search.yahoo.com%2Fsearch%2Fimages%3Fp%3Dradiation%26n%3D30%26ei%3Dutf-8%26tab%3Dorganic%26ri%3D11&w=1014&h=771&imgurl=ffden-2.phys.uaf.edu%2F104_spring2004.web.dir%2Fsmith_England%2Fimages%2Fearth_radiation_cartoon.jpg&rurl=http%3A%2F%2Fffden-2.phys.uaf.edu%2F104_spring2004.web.dir%2Fsmith_England%2FProject%2520template%2F5Radiationandemission.htm&size=152.1+KB&name=Radiation%2C+Reflection%2C+and+Emission+of+Electromagnetic+Energy&p=radiation&oid=56e0f5c42bb9d8d2fb92e7f9ed1d5687&fr2=&fr=&tt=Radiation%252C%2BReflection%252C%2Band%2BEmission%2Bof%2BElectromagnetic%2BEnergy&b=0&ni=36&no=11&tab=organic&ts=&sigr=13du5cuf3&sigb=12o1qpdtd&sigi=12sil89dh&.crumb=oRJdnVE3N2L)

**Food coloring example**

**-food coloring spread faster in the hot water it also went straight down and then toward center if you dropped it at the edges**

**Convection-**

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**Convection cell-**

**-p79 boiling spoon/screw driver/aluminum**

**-p79 does temp of water go down as ice melts**

**-p80 candle and card demo**

**Metals and conductivity**

**Thermal conductivity**

**-air has a low thermal conductivity which is why air in windows is a good insulator**

**-air is not a good insulator in the walls as air moves with hot to the outside and cool to the inside**

**Pot with wooden dowel and screwdriver**

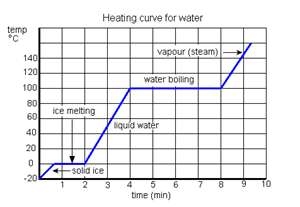
**-screwdriver is larger than aluminum foil and are metals so they have a sea of electrons while the wood does not**

**Specific heat-**

**Q=mcΔT**

**Heat added or lost=mass of object x specific heat of object x change in temperature**

**Water curve**

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**Candle wax and card**

**-crayon melts at a much lower temperature so the card transfers the heat to the crayons and so the temperature does not change while the crayons are melting as the energy is going into the melting process**

**-p84 white and black construction paper**

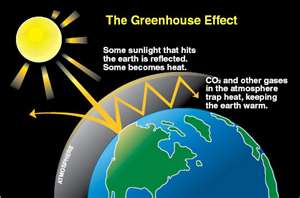
**Construction paper**

**-some materials absorb and radiate heat while others reflect heat**

**-black absorbs and white reflects**

**Real life**

**Greenhouse effect-**

[](http://images.search.yahoo.com/images/view;_ylt=A0PDoS2J4jlPj2wAkJuJzbkF;_ylu=X3oDMTBlMTQ4cGxyBHNlYwNzcgRzbGsDaW1n?back=http%3A%2F%2Fimages.search.yahoo.com%2Fsearch%2Fimages%3Fp%3Dgreenhouse%2Beffect%26n%3D30%26ei%3Dutf-8%26tab%3Dorganic%26ri%3D8&w=525&h=347&imgurl=www.ecy.wa.gov%2Fclimatechange%2Fimages%2Fgreenhouse_effect2.jpg&rurl=http%3A%2F%2Fwww.ecy.wa.gov%2Fclimatechange%2Fwhatis.htm&size=43.2+KB&name=What+are+greenhouse+gases+and+the+greenhouse+effect%3F&p=greenhouse+effect&oid=7c1160942e94296a2bcbdcdae555989e&fr2=&fr=&tt=What%2Bare%2Bgreenhouse%2Bgases%2Band%2Bthe%2Bgreenhouse%2Beffect%253F&b=0&ni=36&no=8&tab=organic&ts=&sigr=11ets6uik&sigb=12v8drg4j&sigi=11qf2otdd&.crumb=oRJdnVE3N2L)